Five-Year Review Report
Byron Barrel & Drum Superfund Site
Genesee County
Byron Township, New York

Prepared by:

United States Environmental Protection Agency
Region 2
New York, New York

September 2007

EXECUTIVE SUMMARY

This is the first five-year review for the Byron Barrel & Drum Superfund site, located in Byron Township, Genesee County, New York. The assessment of this five year review is that the implemented actions at the site protect human health and the environment.

Five-Year Review Summary Form

SITE IDENTIFICATION

Site Name *(from WasteLAN)*: Byron Barrel and Drum

EPA ID *(from WasteLAN)*: NYD980780670

Region: 2	**State:** NY	**City/County:** Byron Township/Genesee County

SITE STATUS

NPL Status: O Final G Deleted G Other (specify)_____

Remediation Status (choose all that apply): G Under Construction O Operating G Complete

Multiple OUs? G YES O NO	**Construction completion date:** 9/24/2002

Are portions of the site in use or suitable for reuse? O YES G NO G N/A

REVIEW STATUS

Lead agency: O EPA G State G Tribe G Other Federal Agency _____

Author name: George Jacob

Author title: Remedial Project Manager	**Author affiliation:** EPA

Review period:** 09/24/2002 to 09/24/2007

Date(s) of site inspection: 05/02/07

Type of review:

G Post-SARA G Pre-SARA G NPL-Removal only
G Non-NPL Remedial Action Site G NPL State/Tribe-lead
G Regional Discretion O Policy G Statutory

Review number: O 1 (first) G 2 (second) G 3 (third) G Other (specify) _____

Triggering action:

G Actual RA Onsite Construction at OU # __ G Actual RA Start at OU#___
O Construction Completion G Previous Five-Year Review Report
G Other (specify) _____

Triggering action date *(from WasteLAN)*: 9/24/2002

Due date *(five years after triggering action date)*: 9/24/2007

Does the report include recommendation(s) and follow-up action(s)? O yes G no
Is human exposure under control? O yes G no
Is migration of contaminated groundwater stabilized? O yes G no G not yet determined
Is the remedy protective of the environment? O yes G no G not yet determined
Acres in use or suitable for use: **restricted:** 8 acres **unrestricted:** ___

Five-Year Review Summary Form (continued)

Issues, Recommendations, and Follow-Up Actions

This site has ongoing operation, maintenance, and monitoring activities as part of the selected remedy. This report did not identify any issue or make any recommendation for the protection of public health and/or the environment which was not included or anticipated by the site decision documents.

Protectiveness Statement

The implemented actions at the site protect human health and the environment. While institutional controls for the groundwater have not been implemented, since groundwater standards will likely be achieved in the near future and since the periodic presence of remediation personnel make it unlikely that the residential use of the property or the installation of groundwater wells for drinking or irrigation would go undetected, such controls are not necessary for the protection of public health until groundwater standards are achieved. Currently, there are no exposure pathways that could result in unacceptable risks and none are expected, as long as the site use does not change and the engineered and access controls that are currently in place continue to be properly operated, monitored, and maintained. The groundwater is not currently being utilized at the site nor is it anticipated that groundwater will be used until groundwater stan dards are achieved.

I. Introduction

This first five-year review for the Byron Barrel & Drum Superfund site, located in Byron Township, Genesee County, New York, was conducted by United States Environmental Protection Agency (EPA) Remedial Project Manager (RPM) George Jacob. The review was conducted in accordance with the Comprehensive Five-Year Review Guidance, OSWER Directive 9355.7-03B-P (June 2001). The purpose of five-year reviews is to ensure that implemented remedies protect public health and the environment and that they function as intended by the site decision documents. This report will become part of the site file.

In accordance with Section 1.3.2 of the five-year review guidance, a policy five-year review is triggered by the signature date of the Preliminary Close-Out Report (PCOR). The trigger for this first five-year review is September 24, 2002, the approval date of the PCOR. This five-year review provides background information, covers the site history, discusses past data-collection efforts along with information collected in the past five years, re-evaluates risk and remedy protectiveness based on updated assumptions, and makes recommendations for follow-up actions.

This five-year review covers the entire site and has determined that the implemented remedy is functioning as intended and continues to protect human health and the environment.

II. Site Chronology

Table 1 (attached) summarize the site-related events from discovery to construction completion.

III. Background

Site Location

The Byron Barrel and Drum site is located on Transit Road in Byron Township, Genesee County, New York. The site is set back approximately 1,000 feet from east side of Transit Road. The major roadways in this area include Route 98 and Route 24.

Physical Characteristics

The site occupies approximately 2 acres of an 8-acre parcel that was used as a salvage yard for heavy construction equipment. Heavily-wooded areas and farmland border the site.

A large, metal former maintenance building is located in the northern portion of the property, an unoccupied house (the property owner's former residence) is located to the west, and a large metal building is located to the southwest. All three structures may not be structurally sound.

The closest body of water is Oak Orchard Creek, which is located within a one-half mile of the site. A small storm water drainage ditch, which flows to the creek, runs along the northern property boundary of the site.

The access road entry area is fenced and gated.

Site Geology/Hydrogeology

The site's geology is typical of the regional geology. It consists of a surface overburden of drained highly organic (muck) soil (now developed as onion fields) with incorporated sand and silt, which averages 20 feet in thickness. The soil was developed from a Pleistocene age former glacial lake bottom. A glacial esker occurs over the soil at the southern part of the site. The esker was formed by the filling of a meltwater channel at the bottom of the retreating glacier, by sand, gravel and boulders derived from the glacier. It is the site of the local gravel pit. The lake developed during glacial retreat on top of a compact, dense and impermeable glacial till, which averages 65 feet in thickness. The till, consisting of a poorly sorted sandy, silty clay, with some coarser debris, was deposited on bedrock. This highly impermeable till averages about 50 feet. The bedrock is an argillaceous (clayey) limestone, with some intermittent dolostone (high magnesium limestone) of Silurian age. The bedrock has an undulating surface, slight fracturing, and no visible porosity. The fractures are infilled with calcium carbonate.

Site monitoring wells have been drilled down into the relatively impervious till and bedrock, and screened within the shallower sand, gravel and silt deposits of the old glacial lake bottom. The water table, encountered at as shallow as 4 feet below ground surface, varies from 11 to 18 feet in thickness. The site is artificially drained in order to support farming. There is no evidence of a perched water table. Groundwater flow direction is north-northwest, away from the esker, and discharging into the Oak Orchard Creek in the western portion of the site. Groundwater velocity in the overburden ranges from 1.40 to 266 feet per year. The till and bedrock are both relatively impervious and, therefore, act as aquicludes (aquitards).

Land and Resource Use

The site is abutted by heavily wooded areas and is directly adjacent to an active vegetable farm. The agricultural land originated from swamp deposits and is locally referred to a "muckland." This land has been classified as prime agricultural land by the State of New York. The soils are apparently highly organic in nature.

With respect to water use, groundwater is used as a potable water source by local residents and as a source of irrigation water by farmers.

History of Contamination

The site which, at the time, was being used as a salvage yard for heavy construction equipment, was discovered in early July 1982, when an unidentified individual reported the disposal of "approximately 400 55-gallon steel barrels that were filled with noxious-smelling chemicals" to the

New York State Police Major Crimes Unit. As a result of this report, a police investigation was initiated. A helicopter flight over the area revealed the presence of a number of drums on the property. Further investigation revealed that Darrell Freeman, Jr., who owned the property, did not possess a permit from either the New York State Department of Environmental Conservation (NYSDEC) or EPA for the storage or disposal of hazardous waste.

As a result of the investigation, a search warrant was issued. Two drum storage areas were located. The first area contained 121 barrels and the second area contained 98 barrels. NYSDEC representatives obtained 11 drum waste samples during the search.

In late July1982, various persons were interviewed regarding waste disposal activities at the site. A former employee of Mr. Freeman reported that he first noted approximately 80 drums on the Freeman property in the Spring of 1978. These drums were located off the east side of the dirt road that runs through the Freeman property. The source further indicated that two more shipments of drums arrived at the site in the summer of 1979. These drums were unloaded and deposited at a site off to the west side of the dirt road behind a small clump of trees. These drum storage locations correspond to those identified during the police search. The source further reported that a fourth load of drums arrived sometime that summer. He did not witness their arrival, but noted that they were piled in front of two cement trucks in an area just south of the second disposal site. The source also indicated that sometime in the fall of 1980, Mr. Freeman instructed him to go to the site of the fourth load of barrels and bury them. Apparently, Mr. Freeman instructed this individual to rip the drums open with a backhoe and bury them and mix them in with the dirt.

Initial Response

Wehran Engineering and Camp Dresser & McKee submitted a preliminary investigation report to NYSDEC in September 1983.

In August 1984, in response to a request from NYSDEC, EPA removed 219 drums and approximately 40 cubic yards of contaminated soil and debris from the site for off-site disposal.

On June 10, 1986, the Byron Barrel and Drum site was placed on the Superfund National Priorities List.

In 1987, EPA's contractor, Ebasco Services, Inc., commenced a remedial investigation and feasibility study (RI/FS). The RI/FS revealed three areas of concern at the site—Source Area 1, a former drum storage and waste disposal area; Source Area 2, a solvent disposal area and maintenance building; and Source Area 3, a shallow ravine containing construction debris and fill material.

Basis for Taking Action

The RI detected volatile organic compounds (VOCs) in the groundwater underlying Source Areas 1 and 2. Hydrogeologic and groundwater quality investigations determined that VOC-impacted groundwater had not migrated to or impacted area drinking water supply wells. Chromium and lead

were detected in a few surface soil samples from Source Area 3 (organic contamination was not detected in this area) and no groundwater impacts were observed.

IV. Remedial Actions

Remedy Selection

In 1989, based upon the results of the RI/FS, EPA selected a remedy for the site, which was documented in the Record of Decision (ROD). Taking into consideration the previous drum and contaminated soil and debris removal effort, the selected remedy addressed the principal threat remaining at the site, calling for the treatment of the contaminated groundwater and low-level residual soil contamination in Source Areas 1 and 2. In addition, the ROD called for further investigation of inorganic contaminants detected in Source Area 3 surface soil. Specifically, the major components of the remedy selected in the ROD were:

- Source Areas 1 and 2: In-situ soil flushing (*i.e.*, extraction and treatment of the contaminated groundwater, followed by the discharge of the treated groundwater to the unsaturated soil to flush the contaminants to the aquifer) and monitoring to ensure the effectiveness of the remedy.

- Source Area 2: Dismantling and decontamination of the maintenance building, if necessary, with disposal of the debris at an off-site landfill[1].

- Source Area 3: Further evaluation of elevated surface soil inorganic contaminant concentrations to determine the need for further soil action, and, if so, to determine the ultimate disposition of contaminated soils.

The remedy also includes institutional controls[2].

Remedy Implementation

In 1990, EPA issued a Unilateral Administrative Order (UAO) to a group of Potentially Responsible Parties (PRPs) that EPA had been abble to identify, for the performance of the design and construction of the selected remedy. The UAO was superseded by a Consent Decree in 1996.

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[1] Because it was believed that contaminated soil extended beneath the on-site maintenance building, the ROD called for the dismantling and decontamination of the building, if necessary.

[2] The ROD called for the imposition of deed restrictions to prevent excavation in areas of subsurface soil contamination. The 1996 Consent Decree between EPA and the Potentially Responsible Parties (PRPs) (see the "Remedy Implementation" section) incorporated institutional controls to protect the integrity of the remedy and to prevent the use of contaminated groundwater for drinking or irrigation until cleanup levels have been met.

Post-RI/FS groundwater quality data indicated a downward trend of VOC concentrations in Source Area 1. Specifically, TCE decreased from 3,300 micrograms per liter (µg/l) to 7 µg/l and trichloroethane (TCA) decreased from 860 µg/l to 57 µg/l (the cleanup levels specified in the ROD for TCE and TCA are 5 µg/l and 50 µg/l, respectively). It is believed that the levels of contamination diminished in the groundwater as a result of the removal of the source of the groundwater contamination (*i.e.*, the drums and contaminated soil and debris) in combination with natural attenuation (dilution, dispersion, and degradation) of the VOC contamination in the groundwater.

The Source Area 3 investigation called for in the ROD consisted of the collection and analysis of 64 soil samples. The results of this investigation showed that the mean chromium and lead concentrations in this area were below the lesser of the ROD cleanup objectives or the New York State's soil Technical and Administrative Guidance Memorandum No. 94-HWR-4046 (TAGM) objectives[3] for these constituents and that there was no significant difference between total chromium and lead concentrations in Source Area 3 soils and background soils[4].

Since the results of the above investigations indicated that the contaminant concentrations in the groundwater in Source Area 1 were only marginally above the cleanup levels specified in the ROD and that the levels of inorganic contaminants in the surface soil in Source Area 3 were consistent with background concentrations, it was concluded that further action in these two areas was not warranted. The contamination in Source Area 2, however, still required remediation (a maximum concentration of 870 µg/l TCA was detected in this area). Therefore, it was decided to proceed with the remedy selected for Source Area 2, namely, in-situ soil flushing, and long-term monitoring. Based upon a pre-design investigation which evaluated the characteristics of the contaminated soil, it was determined that the treated water would not be able to properly percolate through the surface soil. Therefore, to enhance the ability of the treated groundwater to infiltrate and flush the contaminated soil, the remedial design (RD) called for the excavation of several feet of contaminated soil and the construction of an infiltration gallery, consisting of perforated pipe and gravel. The findings related to Source Areas 1 and 3 and the modification to the remedy for Source Area 2 were

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[3] *Division Technical and Administrative Guidance Memorandum: Determination of Soil Cleanup Objectives and Cleanup Levels,* Division of Hazardous Waste Remediation, January 24, 1994.

Since no federal or state Applicable or Relevant and Appropriate Requirements (ARARs) existed for soil at the time that the ROD was signed, the action levels for the organic and inorganic contaminants in the soil were determined through a site-specific analysis. This analysis used fate and transport modeling to determine levels to which contaminants in soils should be reduced in order to ensure no leaching of contaminants to groundwater above Maximum Contaminant Levels (MCLs). Subsequently, NYSDEC developed soil TAGM objectives. TAGM objectives are the more stringent cleanup level between a human-health protection value and a value based on protection of groundwater as specified in the TAGM. Since TAGM objectives were available when the of the Source Area 3 investigation was performed, TAGM objectives were also used to assess the soils in this area.

[4] The mean hexavalent chromium concentration was 1.39 milligrams per kilogram (mg/kg) and the mean lead concentration was 15.71 mg/kg, while the soil cleanup objectives are 50 mg/kg and 400 mg/kg, respectively.

documented in an August 2000 Explanation of Significant Differences (ESD). The RD, prepared by Blasland, Bouck, & Lee, Inc., on behalf of the PRPs, was completed in June 2000. In August 2000, a contract was awarded by the PRP Group to ECOR Solutions, Inc. (ERM C & O Services at that time) for the implementation of the remedy.

Soil Excavation

On June 11, 2001, equipment and personnel were mobilized to the site. Following the clearing of vegetation and the construction of an access road, approximately, 500 cubic yard of contaminated soil (approximately an area of 2,555 square feet to a depth of 5 feet) was excavated for the construction of the infiltration gallery. The excavated soil was stockpiled for testing; the analysis of this soil indicated that it met TAGM objectives. Therefore, the soil was used as fill above the infiltration gallery.

Because it was believed that contaminated soil extended beneath the on-site maintenance building in Source Area 2, the ROD called for the dismantling and decontamination, if necessary, of the building, with the disposal of the debris off-site. Since the post-excavation side wall sampling in the vicinity of the maintenance building indicated that the soil contamination did not extend beneath the building, the building was not dismantled. The building was, however, decontaminated (see below).

Building Decontamination

The maintenance building was decontaminated in November 2001 by ECOR Solutions, Inc. The decontamination activities included the removal and off-site disposal of approximately 200 individual containers of paint, thinners, solvents, and other paint-related material followed by the spray washing of the building. In total, 5 cubic yard boxes of paint waste, 3 drums of rinse water, and 5 drums of hazardous waste were transported by Hazmat Environmental Group, Inc. to Ensco, an approved treatment, storage, and disposal facility located in Arizona.

Infiltration Gallery

Approximately 200 linear feet of 2-inch slotted PVC pipes were installed at the bottom of the excavation described above. The pipes were wrapped in a geomembrane covering (to filter out soil particles) and placed in a 1-foot thick gravel bed. The excavation was then backfilled with the previously-excavated soils.

Groundwater Extraction Well Installation

During the performance of design investigation work in 1999, one groundwater recovery well was installed for a pump test. This well was converted to an extraction well and two additional extraction wells were installed. All three wells are screened at 25 feet below grade. Submersible pumps rated at 3 – 10 gpm at 210 to 70 feet of head were installed in all three wells. The average groundwater extraction rate is 20 gpm.

Groundwater Treatment System Installation

The groundwater treatment system includes a bag filter which removes solids greater than 50 microns. After the bag filter, the groundwater is routed through a low-profile air stripping unit (150 standard cubic feet per minute), which removes the VOCs from the groundwater. Following air stripping, the groundwater can be directed either to surface water or to a combination of surface water and the infiltration gallery for in-situ flushing of the unsaturated soils. Discharges to Oak Orchard Creek and the infiltration gallery must meet New York State Pollutant Discharge Elimination System requirements.

The construction of the groundwater treatment system was completed on July 15, 2001. An interim remedial action report for the groundwater remedy was approved on September 30, 2002.

To date, more than 20 million gallons of groundwater have been treated and approximately 35.5 pounds of dissolved-phase total VOCs have been recovered.

Soil Flushing

Approximately 1 gallon per minute (gpm) of treated groundwater was discharged through the infiltration gallery to flush the contaminants from the unsaturated zone soils. The reminder of the treated groundwater (approximately 19 gpm) was discharged to Oak Orchard Creek.

On August 14, 2002, soil samples were collected from the area undergoing soil flushing. The analytical results from the soil sampling indicated that the soil has achieved the lesser of the ROD's cleanup objectives or the TAGM objectives[5]. On September 30, 2002, a remedial action report for the soil was approved.

Institutional Controls Implementation

Since the contaminated soils have been remediated to levels that protect human health and the groundwater, they are suitable for unlimited use and unrestricted exposure, the soil-related deed restrictions called for in the ROD are no longer needed.

Attempts to effect deed restrictions to prohibit the residential use of this property and the installation of groundwater wells for drinking or irrigation until groundwater standards are achieved have not

[5] Since no federal or state ARARs existed for soil at the time that the ROD was signed, the action levels for the organic and inorganic contaminants in the soil were determined through a site-specific analysis. This analysis used fate and transport modeling to determine levels to which contaminants in soils should be reduced in order to ensure no leaching of contaminants to groundwater above MCLs. Subsequently, NYSDEC developed soil TAGM objectives. Since TAGM objectives were available when the of the Source Area 2 soil sampling was performed, TAGM objectives were also used to assess these soils.

been successful. The site owner failed to comply with a unilateral administrative order issued to him, a transporter, and two generators in 1991, requiring the performance of the remedial design/remedial action (RD/RA) at the site. As a result, the response action is being performed by the two generators as Settling Defendants pursuant to a subsequent consent decree with the United States. The site owner failed to provide access to the site in order to implement the RD/RA, so EPA sought and obtained access by court order. The site owner failed to reimburse EPA's response costs and failed to perform pursuant to an administrative order so EPA sought and obtained a federal court judgment for CERCLA costs and for penalties, which judgment has remained completely unsatisfied since 1997. EPA has been unable to locate the site owner for many years. His last known residence was in Florida. The Settling Defendants similarly have been unsuccessful in locating the site owner. Thus, it is not feasible to expect that the site owner will be located or, if located, that he will cooperate in imposing institutional controls against the property.

System Operations/Operation and Maintenance

The Operation and Maintenance (O&M) Manual for the site contains the procedures for operating, inspecting, and evaluating the groundwater extraction and treatment system along with the long-term monitoring of groundwater. Repairs are to be made, as necessary, to control the effect of any event that might interfere with the performance of the remedy.

Scheduled O&M activities include weekly overall site inspections and groundwater extraction, treatment (checking the bag filter for solids loading, gauging air flow through the stripper, and noting flow rates and totalized flow), and reinjection system inspections. Preventive maintenance items include monthly inspections of the air stripper blower and the air stripper trays for sediment and mineral deposits. The trays are cleaned on a quarterly basis as a preventative maintenance and system operation performance item.

The inspections, maintenance, sampling, monitoring, data evaluation and reporting costs are approximately $65,000 on an annual basis; these costs are broken down in Table 2 (attached).

V. Five-Year Review Process

Administrative Components

The five-year review team consisted of George Jacob (RPM), Richard Krauser (hydrogeologist), Charles Nace (human health risk assessor), and Mindy Pensak (ecological risk assessor, Biological Technical Assistance Group).

Community Involvement

The EPA Community Involvement Coordinator (CIC) for the Byron Barrel and Drum site, Mike Basile, published a notice in the *Batavia Daily News*, a local newspaper, on May 10, 2007, notifying the community of the initiation of the five-year review process. The notice indicated that EPA would be conducting a five-year review of the site to ensure that the site is protective of public health and

the environment and that the implemented components of the remedy are functioning as designed. It was also indicated that once the five-year review is completed, the results will be made available in the local site repository. In addition, the notice included the addresses and telephone numbers for the RPM and CIC for questions related to the five-year review process or the Byron Barrel and Drum site.

Document Review

The documents, data, and information which were reviewed in completing the five-year review are summarized in Table 3 (attached).

Data Review

The primary compounds of concern detected in the groundwater at the site are TCA, 1,1-dichloroethane (1,1-DCA), and 1,1-dichloroethylene (1,1-DCE)[6]. Based upon a review of the data collected during the review period and a trend analysis, it appears that there is an overall downward trend in VOC concentrations in all three of the on-site monitoring wells and two of the three extraction wells. The levels of 1,1-DCA and 1,1-DCE are currently either not detected or are marginally above their respective MCLs in the three on-site monitoring wells and the three extraction wells. In one extraction well, the levels of TCA were consistently below the MCL for four years and then sharply increased during the latest sampling event to 170 µg/l. In the beginning of the review period, the TCA concentrations in all of the wells ranged from 4 µg/l to 1,700 µg/l. The levels of TCA in two of the monitoring wells are now currently marginally above the MCL; in one monitoring well and the three extraction wells, the levels of TCA range from 160 to 230 µg/l.

Site Inspection

On May 2, 2007, a five-year review-related site inspection was conducted by George Jacob, Richard Krauser, and Charles Nace. Also present at the site inspection were John Grawthol (NYSDEC project manager), Matt Lapp (PRP consultant ECOR Solutions, Inc.), Chris Rockwell (Garlock Inc., a PRP), and William Torres (PRP consultant ECOR Solutions, Inc.).

The access road and site fencing were in good condition. There were no visible signs of trespassing or vandalism. All of the well casings were found to be properly secured and locked. The pump room was found to be properly secured and locked.

Interviews

An interview was conducted on May 2, 2007 with Chris Rockwell of Garlock Inc., a PRP, for this review.

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[6] The MCL for all three compounds is 5 µg/l.

Institutional Controls Verification

As was noted above, since the contaminated soils have been remediated, the soil-related deed restrictions called for in the ROD are not needed. While it does not appear likely that a deed restriction or an environmental easement with the property owner to prohibit the residential use of this property and the installation of groundwater wells for drinking or irrigation until groundwater standards are achieved can be effected, such controls are not necessary for the protection of public health. The access road entry area is fenced and gated and the existing residence on the site is uninhabitable and may be demolished. Moreover, the Settling Defendants' contractor performs site inspections on a weekly basis, so it is unlikely that the residential use of the property or the installation of groundwater wells for drinking or irrigation would go undetected. Nevertheless, EPA will request that the Settling Defendants attempt to file a public notice in the local land records in order to provide information to the public that the drinking water aquifer underlying the site is contaminated and that persons should not install wells at the site until the cleanup has been completed.

Other Comments on Operation, Maintenance, Monitoring, and Institutional Controls

Table 4 (attached) presents comments and offers suggestions.

VI. Technical Assessment

Question A: Is the remedy functioning as intended by the decision documents?

The remedy identified in the ROD consists of building decontamination and in-situ soil flushing to address the contaminated soil and groundwater. The building was decontaminated. While the site's soil and the groundwater in Area 1 have met the cleanup objectives (the groundwater in Area 3 was not contaminated), the Area 2 groundwater is still contaminated. Therefore, the groundwater extraction, treatment, and reinjection system in Area 2 (through the previously-contaminated soil) is still operating. Based on the site visit and a review of the existing data, the remedy is functioning as intended.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of the remedy still valid?

The exposure assumptions and toxicity data that were used to estimate the potential risks and hazards to human health followed the standard risk assessment paradigm in use at the time. Although specific values for exposure parameters and toxicity data may have changed since the time the risk assessment was completed, the process that was used is still valid.

Since no federal or state ARARs existed for soil at the time that the ROD was signed, the action levels for the organic and inorganic contaminants in the soil were determined through a site-specific analysis. This analysis used fate and transport modeling to determine levels to which contaminants in soils should be reduced in order to ensure no leaching of contaminants to groundwater above

MCLs. Subsequently, NYSDEC developed soil TAGM objectives. TAGM objectives are the more stringent cleanup level between a human-health protection value and a value based on protection of groundwater as specified in the TAGM. All of these levels fall within EPA's acceptable risk range. Since TAGM objectives were available when the Source Area 3 investigation and the Source Area 2 post-remediation soil sampling was performed, TAGM objectives were used to assess the soils in these areas. Based upon sample results, the soils in these areas have achieved the ROD-specified cleanup levels and the TAGM objectives. Table 5 compares the soil cleanup levels identified in the ROD to the TAGM objectives that were ultimately used.

Since the soils have met the ROD-specified cleanup levels and the TAGM objectives, they no longer pose a human health risk. In addition, since the TAGM objectives are protective of the groundwater, they do not pose a threat to the groundwater. While the groundwater is still contaminated, given that it is not being used as a drinking water source, this potential human exposure pathway is not complete under current conditions. The cleanup levels that were used for the groundwater remedial action were the lower of the New York State Drinking Water Standards and the Federal Drinking Water Standards. The groundwater cleanup values that were presented in the ROD have been compared to the current cleanup values that would be used (see Table 6). Based on this comparison, the cleanup levels for groundwater are still valid, although the current values should be used for determining success in meeting the groundwater remedial action objectives. The remedial action objectives (preventing human contact with contaminated soil and groundwater and restoring the aquifer) are still valid.

Vapor intrusion was not evaluated as part of the original risk assessment. Given that there are VOCs present in the groundwater, an analysis was performed to determine if the vapor intrusion pathway is currently a completed pathway. Although there are structures present on the property, they are all currently vacant and do not appear to be structurally sound. Since there are no current receptors and it does not appear that there will be in the near future, the vapor intrusion pathway is not currently complete. Therefore, at this time, vapor intrusion is not an issue at this site. If the structures were to be occupied in the future, a more thorough evaluation would need to be completed to ensure that the vapor intrusion pathway is not a potential problem.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

There is no information that calls into question the protectiveness of the remedy. However, it was noted during the inspection that the structures located on the property may not be structurally sound and may present a physical hazard to trespassers or remedial site workers. Therefore, it may be prudent to evaluate the integrity of the structures and determine whether they should be demolished.

Technical Assessment Summary

Based upon the results of the five-year review, it has been concluded that:

- The groundwater extraction and treatment system is operating as designed;

- The monitoring wells are securely locked and functional;
- The structures located on the property may not be structurally sound and may present a physical hazard; and
- No additional measures are needed to protect public health.

VII. Issues, Recommendations, and Follow-Up Actions

This site has ongoing operation, maintenance, and monitoring activities as part of the remedy. There are no suggestions for improving, modifying and/or adjusting these activities.

Table 4 (attached) summarizes comments and suggestions stemming from this 5-year review.

VIII. Protectiveness Statement

The implemented actions at the site protect human health and the environment. While institutional controls for the groundwater have not been implemented, since groundwater standards will likely be achieved in the near future and since the periodic presence of remediation personnel make it unlikely that the residential use of the property or the installation of groundwater wells for drinking or irrigation would go undetected, such controls are not necessary for the protection of public health until groundwater standards are achieved. Currently, there are no exposure pathways that could result in unacceptable risks and none are expected, as long as the site use does not change and the engineered and access controls that are currently in place continue to be properly operated, monitored, and maintained. The groundwater is not currently being utilized at the site nor is it anticipated that groundwater will be used until groundwater standards are achieved.

IX. Next Review

The next review is due within five years of the signature date of this report, or before September 2012.

Approved:

George Pavlou, Director
Emergency and Remedial Response Division

9/21/07
Date

Table 1: Chronology of Site Events	
Event	**Date(s)**
Discovery of drum disposal locations	1982
EPA Removal Action	1984
Site placed on National Priorities List	1986
Remedial Investigation and Feasibility Study	1987-1989
Record of Decision	1989
Unilateral Administrative Order issued to potentially responsible parties by EPA	1990
Consent Decree supersedes Unilateral Administrative Order	1996
Remedial Design	1990-2000
Explanation of Significant Differences	2000
Groundwater Remedial Action commences	2000
Soil Remedial Action	2000-2002
Preliminary Close-Out Report	2002

Table 2: Annual Operation, Maintenance, and Monitoring Costs	
Activity	**Cost per Year**
Sampling, analysis, data evaluation, and reporting	$60,000
Site inspection/maintenance	$5,000
Total estimated cost	*$65,000*

Table 3: Documents, Data, and Information Reviewed in Completing the Five-Year Review	
Document Title, Author	**Submittal Date**
Remedial Investigation/Feasibility Study, Ebasco Services, Inc.	1987
Record of Decision, EPA	1989
Final Design Report, Blasland, Bouck, & Lee, Inc.	2000
Operation and Maintenance Monitoring Manual, ECOR Solutions, Inc.	2001
Preliminary Close-Out Report, EPA	2002
Post-Closure Annual Groundwater Quality Monitoring Letter Reports, Malcolm Pirnie	2002-2007
EPA guidance for conducting five-year reviews and other guidance and regulations to determine if any new Applicable or Relevant and Appropriate Requirements relating to the protectiveness of the remedy have been developed since EPA issued the ROD.	

Table 4: Other Comments on Operation, Maintenance, Monitoring, and Institutional Controls	
Comment	**Suggestion**
While it does not appear likely that a deed restriction or an environmental easement with the property owner to prohibit the residential use of this property and the installation of groundwater wells for drinking or irrigation until groundwater standards are achieved can be effected, such controls are not necessary for the protection of public health. The access road entry area is fenced and gated and the existing residence on the site is uninhabitable and may be demolished. Moreover, the Settling Defendants' contractor performs site inspections on a weekly basis, so it is unlikely that the residential use of the property or the installation of groundwater wells for drinking or irrigation would go undetected.	An attempt should be made to file a public notice in the local land records in order to provide information to the public that the drinking water aquifer underlying the site is contaminated and that persons should not install wells at the site until the cleanup has been completed.
New York State now requires annual certifications that institutional controls that are required by RODs are in place and that remedy-related operation and maintenance (O&M) is being performed.	Concurrent with the monthly On a m annual basis, the site will need to be inspected to determine whether any groundwater wells have been installed at the site. The fourth quarter O&M report should include a certification that remedy-related O&M is being performed. Once the institutional controls are put into place, the fourth quarter O&M report should include a certification that the institutional controls are in place, as well.
The three structures located on the property may not be structurally sound and may present a physical hazard to trespassers or remedial site workers.	It may be prudent to evaluate the integrity of the structures and determine whether they should be demolished.
Reuse opportunities may exist for the site.	The PRPs should approach the Township, property owner, adjacent property owners and/or other real estate interests to ascertain if there are any reuse opportunities for this site. If such opportunities exist, then a reuse plan should be developed. This plan would need to be a collaborative effort between the interested parties. The reuse plan would need to address future property ownership, institutional controls, and the final status of the existing structures and foundations on the site should be developed.

Table 5: Comparison of Soil Cleanup Values Presented in the ROD Versus Current Cleanup Values				
Chemical of Potential Concern	**From 1989 ROD**			**TAGM Objective µg/kg**
	Cleanup Level µg/kg	**Risk 10^{-6} µg/kg**	**Risk 10^{-4} µg/kg**	
Ethyl Benzene	56,000	52,000	52,000	50,000
Toluene	45,000	36,000	36,000	15,000
Xylenes	8,200	58,000	58,000	12,000
1,1,1-trichloroethane	2,300	5,500	5,500	800
Tetrachloroethene	140	8.4	840	14,000
Trichloroethene	47	4.9	490	700

Table 6: Comparison of Groundwater Cleanup Values Presented in the ROD Versus Current Cleanup Values		
Chemical of Potential Concern	**ROD Cleanup Level (μg/l)**	**Lower of Current Federal MCL or New York State MCL (μg/l)**
Benzene	5	5
Toluene	2,000	1000
Xylenes	440	10,000
Chlorobenzenes	488	5
1,2-dichlorobenzene	620	600
1,4-dichlorobenzene	75	75
1,1,2-trichloroethane	5	5
1,1,1-trichloroethane	200	200
1,2-dichloroethane	5	5
1,1,-dichloroethane	5	5
Tetrachloroethene	5	5
Trichloroethene	5	5
1,1-dichloroethene	7	7
Vinyl chloride	2	2
Chloroform	100	80
Methylene chloride	100	-
Bromodichloromethane	100	80
Chlorodibromethane	100	-
N-nitrosodiphenylamine	4.9	-
2-butanone	172	-
Carbon tetrachloride	5	5

Table 7: Acronyms Used in this Document	
ARARs	Applicable or Relevant and Appropriate Requirements
CIC	Community Involvement Coordinator
DCA	Dichloroethane
DCE	Dichloroethylene
EPA	United States Environmental Protection Agency
gpm	Gallons per Minute
MCLs	Maximum Contaminant Levels
mg/kg	Milligram per Kilogram
µg/kg	Micrograms per Kilogram
µg/l	Micrograms per Liter
MCL	Maximum Contaminant Level
NYSDEC	New York State Department of Environmental Protection
O&M	operation and maintenance
PCOR	Preliminary Close-Out Report
RI/FS	Remedial Investigation/Feasibility Study
PRPs	Potentially Responsible Parties
RD	Remedial Design
ROD	Record of Decision
RPM	Remedial Project Manager
TAGM	Technical and Administrative Guidance Memorandum
TCA	Trichloroethane
UAO	Unilateral Administrative Order
VOCs	Volatile Organic Compounds
VOCs	Volatile Organic Compounds